IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently amended) A method of generating complementary masks for use in a multiple-exposure lithographic imaging process, said method comprising the steps of:

generating a model defining the imaging performance of said multiple-exposure lithographic imaging process,

identifying a target pattern having a plurality of features, said plurality of features comprising horizontal and vertical edges,

generating a horizontal mask based on said target pattern,

generating a vertical mask based on said target pattern, and

performing a shielding step in which at least one of the vertical edges of the plurality of features in the target pattern is replaced by a shield in the horizontal mask, and in which at least one of the horizontal edges of the plurality of features in the target pattern is replaced by a shield in the vertical mask, said shields having a width which is greater that the width of the corresponding feature in the target pattern,

wherein the amount of shielding to be applied in said shielding step is determined utilizing said model.

2. (Original) The method of generating complementary masks according to claim 1, further comprising:

performing an assist feature placement step in which sub-resolution assist features are disposed parallel to at least one of the horizontal edges of the plurality of features in the horizontal mask, and are disposed parallel to at least one of the vertical edges of the plurality of features in the vertical mask, and

performing a feature biasing step in which at least one of the horizontal edges of the plurality of features in the horizontal mask are adjusted such that the resulting feature accurately reproduces the target pattern, and at least one of the vertical edges of the plurality of features in the vertical mask are adjusted such that the resulting feature accurately reproduces the target pattern.

3. (Original) The method of generating complementary masks according to claim 1, wherein prior to said shielding step said horizontal mask and said vertical mask are identical to said target pattern.

4. (Cancelled)

5. (Currently amended) The method of generating complementary masks according to claim 1 [[4]], wherein said ~~system pseudo-intensity function~~ model is determined utilizing one of a calibrated model of the multiple-exposure lithographic imaging process or a theoretical model of the multiple-exposure lithographic imaging process.

6. (Original) The method of generating complementary masks according to claim 2, wherein said assist feature placement step is performed prior to said shielding step.

7. (Currently amended) An apparatus for generating complementary mask patterns for use in a multiple-exposure lithographic imaging process, said apparatus comprising:

means for generating a model defining the imaging performance of said multiple-exposure lithographic imaging process;

means for identifying a target pattern having a plurality of features, said plurality of features comprising horizontal and vertical edges,

means for generating a horizontal mask based on said target pattern,

means for generating a vertical mask based on said target pattern, and

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means for performing shielding in which at least one of the vertical edges of the plurality of features in the target pattern is replaced by a shield in the horizontal mask, and in which at least one of the horizontal edges of the plurality of features in the target pattern is replaced by a shield in the vertical mask, said shields having a width which is greater that the width of the corresponding feature in the target pattern,

wherein the amount of shielding to be applied to said at least one vertical edge of the plurality of features and said at least one horizontal edge of the plurality of features is determined utilizing said model.

8. (Original) An apparatus for generating complementary masks according to claim 7, further comprising:

means for performing an assist feature placement in which sub-resolution assist features are disposed parallel to at least one of the horizontal edges of the plurality of features in the horizontal mask, and are disposed parallel to at least one of the vertical edges of the plurality of features in the vertical mask, and

means for performing a feature biasing in which at least one of the horizontal edges of the plurality of features in the horizontal mask are adjusted such that the resulting feature accurately reproduces the target pattern, and at least one of the vertical edges of the plurality of features in the vertical mask are adjusted such that the resulting feature accurately reproduces the target pattern.

9. (Original) An apparatus for generating complementary masks according to claim 7, wherein prior to said shielding said horizontal mask and said vertical mask are identical to said target pattern.

10. (Cancelled)

11. (Currently amended) An apparatus for generating complementary masks according to claim 7 ~~10~~, wherein said ~~system pseudo-intensity function~~ model is determined utilizing one of a calibrated model of the multiple-exposure lithographic imaging process or a theoretical model of the multiple-exposure lithographic imaging process.

12. (Original) An apparatus for generating complementary masks according to claim 8, wherein said assist feature placement is performed prior to said shielding.

13-18. (Cancelled)

19. (Currently amended) A computer program product for controlling a computer comprising a recording medium readable by the computer, means recorded on the recording medium for directing the computer to generate files corresponding to complementary masks for use in a multiple-exposure lithographic imaging process, said generation of said files comprising the steps of:

generating a model defining the imaging performance of said multiple-exposure lithographic process,

identifying a target pattern having a plurality of features, said plurality of features comprising horizontal and vertical edges,

generating a horizontal mask based on said target pattern,

generating a vertical mask based on said target pattern, and

performing a shielding step in which at least one of the vertical edges of the plurality of features in the target pattern is replaced by a shield in the horizontal mask, and in which at least one of the horizontal edges of the plurality of features in the target pattern is replaced by a shield in the vertical mask, said shields having a width which is greater that the width of the corresponding feature in the target pattern,

wherein the amount of shielding to be applied is said shielding step is determined utilizing said model.

20. (Original) The computer program product of claim 19, wherein said generation of said files further comprises:

performing an assist feature placement step in which sub-resolution assist features are disposed parallel to at least one of the horizontal edges of the plurality of features in the horizontal mask, and are disposed parallel to at least one of the vertical edges of the plurality of features in the vertical mask., and

performing a feature biasing step in which at least one of the horizontal edges of the plurality of features in the horizontal mask are adjusted such that the resulting feature accurately reproduces the target pattern, and at least one of the vertical edges of the plurality of features in the vertical mask are adjusted such that the resulting feature accurately reproduces the target pattern.

21. (Original) The computer program product of claim 19, wherein prior to said shielding step said horizontal mask and said vertical mask are identical to said target pattern.

22. (Cancelled)

23. (Currently amended) The computer program product of claim 19 ~~22~~, wherein said ~~system pseudo-intensity function~~ model is determined utilizing one of a calibrated model of the multiple-exposure lithographic imaging process or a theoretical model of the multiple-exposure lithographic imaging process.

24. (Original) A device manufacturing method comprising the steps of:

(a) providing a substrate that is at least partially covered by a layer of radiation-sensitive material;

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(b) providing a projection beam of radiation using a radiation system;

(c) using patterning means to endow the projection beam with a pattern in its cross-section;

(d) projecting the patterned beam of radiation onto a target portion of the layer of radiation-sensitive material,

wherein steps (c) and (d) are performed a first time with a first pattern and then a second time with a second pattern, said first and second patterns being generated using a method according to claim 1.

25. (New) The method of generating complementary masks according to claim 1, wherein said shielding step comprises dividing a given edge to be shielded into a plurality of segments and having the shielding applied on a segment by segment basis.

26. (New) The method of generating complementary masks according to claim 2, wherein the amount of biasing applying to a given feature edge in said feature biasing step is determined utilizing said model.

27. (New) The apparatus for generating complementary masks according to claim 7, wherein said shielding comprises dividing a given edge to be shielded into a plurality of segments and having the shielding applied on a segment by segment basis.

28. (New) The apparatus for generating complementary masks according to claim 8, wherein the amount of biasing applying to a given feature edge is determined utilizing said model.

29. (New) The method for printing a pattern according to claim 13, wherein said shielding step comprises dividing a given edge to be shielded into a plurality of segments and having the shielding applied on a segment by segment basis.

30. (New) The method for printing a pattern according to claim 14, wherein the amount of biasing applying to a given feature edge in said feature biasing step is determined utilizing said model.

31. (New) The computer program product according to claim 19, wherein said shielding step comprises dividing a given edge to be shielded into a plurality of segments and having the shielding applied on a segment by segment basis.

32. (New) The computer program product according to claim 20, wherein the amount of biasing applying to a given feature edge in said feature biasing step is determined utilizing said model.